

FINAL REPORT

UWA00022

Quality screening support for pulse breeding programs - Western Region

PROJECT DETAILS

PROJECT CODE: UWA00022

PROJECT TITLE: QUALITY SCREENING SUPPORT FOR PULSE BREEDING PROGRAMS - WESTERN REGION

START DATE: 01.07.2002

END DATE: 30.06.2003

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Summary

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Conclusions

In achieving its aims and outputs, this project has continued to provide vital quality support to Western Australian (WA) based pulse breeding programs, variety evaluation and agronomic trials. The focus of the quality work has been further sharpened as a result of input from the national reference groups and the progressive introduction of near-infrared (NIR) and digital technologies. The overall conclusion of this work is that there is a general improvement in the quality of the material coming through the breeding programs. This will result in a number of high quality new releases in coming years.

Recommendations

Continued funding of this work will allow the quality of WA pulses to be maintained and improved in new varieties. Main users of the new varieties will be the grain growers of the western region and marketers will also benefit. New varieties have been shown to be quickly adopted in WA, reaching maximum adoption in about five years. Despite poor seasons and setbacks to the chickpea breeding program due to disease outbreak, new high quality varieties are about to be released (see Attachment 7). It is likely that several new field pea varieties will be facilitated by this project during the next three years. In addition, technologies such as digital imaging applications need to be further developed to allow a more rapid evaluation of size, shape and colour parameters of samples of pulses. It will also enable the further development of a record of the visual appearance of new lines and pre-release material for use by breeders and traders. The use of well-documented and referenced grain images has great potential to increase links between breeders, agronomists, quality evaluators, marketers and end-users, as significant importance is still placed on the visual qualities of pulses.

Achievements/Benefits

During the period from the beginning of January to the end of March 2003, the F6, F7 and F8 lines from the field pea and chickpea breeding programs were tested and the results reported to the breeder so that selection decisions could be made in preparation for 2003 seeding. In February 2003, the Stage 3 and 4 sample results from 2002 were reported at the annual CVT meeting to assist in decisions about the promotion of lines to the next stage of development.

Originally the imagery component was intended to be part of a three-year project, but progress has been made in developing digital imaging methodology to assist in pulse breeding. The equipment has been purchased and installed in the laboratory. The optical conditions needed to optimise the measurement of seed size distribution by imaging have been established and work is in progress using Stage 4 field peas to correlate this with traditional methods. Images have been captured and included in the reporting of Stage 3 and 4 quality data. Further developments will depend on funding.

Ongoing developments in methodology, including progress in digital imaging work, have been communicated to the Australian Pulse Quality Committee at national meetings in March 2003. However, since the lapse of funding for national coordination of pulse quality, the management of the national pulse quality database has lapsed.

Other research

A detailed investigation into the physiological factors contributing to good dehulling quality in field peas and desi chickpeas. This may include seed size, seed coat thickness and dimpling. There may also be an interaction with chemical composition of the seed coat or cotyledon. The potential for the use of NIR technology to predict quality characteristics has also yet to be fully explored.

Additional information

Attachments

Attachment 1 - Summary of 2002/2003 laboratory activities.

Attachment 2 - 2001 CVT results including sample images.

Attachment 3 - Results, images and paper from desiccation trials.

Attachment 4 - Seed size distribution affect on crude protein trial on field peas at various sowing times.

Attachment 5 - Seed size distribution affect on crude protein trial on lupins at different row spacings (with & without irrigation).

Attachment 7 - Field Pea digital imaging standards - size distributions comparisons by sieve and imaging.

Attachment 8 - Release status of advanced breeding lines.